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Case report

A rare and serious consequence of a rat bite

ND Downing, GD Dewnany, PJ Radford

Department of Orthopaedic Surgery, Queen's Medical Centre, University Hospital, Nottingham, UK

Contact with rat saliva or faeces can lead to infection with *Streptobacillus moniliformis* and the condition known as 'rat bite fever'. We report a case of septic arthritis of the hip due to this organism following a bite on the finger of a 14-year-old boy from a rat for sale in a pet shop. The case was successfully treated by arthrotomy, drainage and joint lavage followed by administration of penicillin. Septic arthritis of the hip due to *S. moniliformis* has not been previously described and this case highlights a possible danger of keeping rats as pets.

Key words: Rat-bite fever – Septic arthritis – Hip – Arthrotomy – *Streptobacillus*

A 13-year-old boy presented with a 9 day history of malaise and fluctuating arthralgia affecting the right hip. He had previously been entirely fit and well. On the day of admission his pain had worsened and he became unable to bear weight on his right leg. At initial presentation he had been apyrexial, but a few hours after admission his temperature rose to 39°C. Examination revealed the hip to be held in slight flexion and external rotation and any attempt at passive movement was associated with painful muscle spasm. The white cell count was within normal limits but the ESR was over 100 and the CRP 69. An ultrasound scan revealed an effusion within the hip joint. He was subsequently taken to theatre where an arthrotomy and joint lavage were performed. At arthrotomy, seropurulent material was obtained and sent for culture. Initial examination of this material revealed Gram-negative bacilli sensitive to penicillin. Eventually, using special culture media, *Streptobacillus moniliformis* was isolated.

Joint infection with *S. moniliformis* is extremely rare and is the organism associated with 'rat bite fever'. Further questioning of the patient and his parents revealed that, 5 days before the onset of symptoms, he had been bitten on the fingertip by a rat for sale in a pet shop. Examination of this finger revealed a healing wound that had not been associated with local sepsis.

The infection was successfully treated initially with intravenous penicillin followed by oral amoxycillin for 6 weeks. Subsequent clinical course was uneventful and the patient made a complete recovery.

Discussion

Rat bite fever is a rare bacterial illness that results from infection with *S. moniliformis*. a Gram-negative bacillus that is a natural commensal of rodent respiratory tract. Nasopharyngeal carriage in healthy laboratory rats ranges from 10–100%, in wild rats carriage rates range

Correspondence to: Dr ND Downing, Department of Orthopaedic Surgery, Queen's Medical Centre, University Hospital, Nottingham NG7 2UH, UK.

from 50–100%.[1] Infection in humans is rare but has been most commonly reported in laboratory personnel and children.[2] Most infections are acquired through rat bites or scratches,[3] though there are reported cases without direct rodent contact[4] or through ingestion of food or water contaminated with rat faeces.[5] Cases of rat bite fever have also been associated with gerbils,[6] squirrels, mice and animals such as cats and dogs that prey on these rodents.[1] The incubation period of rat bite fever can range from 1–22 days, but onset is usually between 2–10 days after the bite.[1]

The syndrome of rat bite fever typically presents with fluctuating fever, malaise, asymmetric polyarthralgia and maculopapular rash on the extremities, although the case reported here was not associated with skin manifestations. Associated endocarditis, myocarditis, meningitis, pneumonia, and focal abscesses have also been reported. Septic arthritis due to this condition is extremely rare,[7] and has not been previously reported in the hip of a child.

S. moniliformis is a Gram-negative facultative anaerobe with strict growth requirements and slow growth that makes it difficult to culture. There is no reliable aerological test for the organism. Penicillin is the treatment of choice for this organism. As penicillin acts by interfering with bacterial cell wall synthesis, it is typically most effective against Gram-positive organisms (with the exception of certain Gram-negative cocci such as neisserias). The finding of a Gram-negative rod highly sensitive to penicillin is unusual and should raise the suspicion of the presence of *S. moniliformis*.

The increased interest in keeping rodents, particularly rats, as pets and their wide availability in pet shops raises the possibility of an increase in the incidence of anthropozoonoses such as rat bite fever. Infection with *S. moniliformis* is particularly easy to overlook because of its fastidious growth requirements, but it should be borne in mind when the presentation of joint sepsis is atypical and history of exposure to rodents should be sought.

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